New Pathways Bringing Engineering and Tech-Ed Worlds Together

Thanks to a collaborative initiative taking place within the Office of Career and Technical Education (OCTE), new pathways are being created by blending some very traditional programs with Project Lead The Way (PLTW) curriculum.

Pictured are PLTW students getting a lesson about the properties of pneumatics in an automotive technology class.

The new pathways will be in automotive, manufacturing and construction engineering.

On the surface, these pathways would seem to represent a bringing together of two separate worlds, but, that is really not the case, according to Associate Commissioner Dale Winkler, who said many of the traditional programs have long had an engineering connection.

"Programs such as automotive, construction, and manufacturing technologies serve as the basis for so many engineering pathways and really always have," he said. "In bringing these programs together, we now can give our students an extra level of knowledge if they choose one of these directions."

Winkler added that not only does this enhance what a student will learn but gives them an extra leg up when the time comes to look for a job.

The workforce sector, especially in certain areas like advanced manufacturing, has strongly voiced its concerns about a lack of qualified employees to fill job opportunities that now demand more advanced skills with a higher degree of technology innovation.

Mary Taylor, OCTE Industry Training and Development Specialist said bringing these program areas together is just common sense when it comes to filling that void in the workforce while giving students a better chance of landing those high-tech jobs once they are finished with their education.

"We are doing this because industry needs students that have applied knowledge of engineering. They need the combination of the two different types of project-based

learning," she said. "There are CTE schools at the secondary level that teach both the PLTW curriculum and traditional tech programs and when those programs work together, I have never seen it be anything but positive for both the students and the teachers. Now employers will reap the benefits."

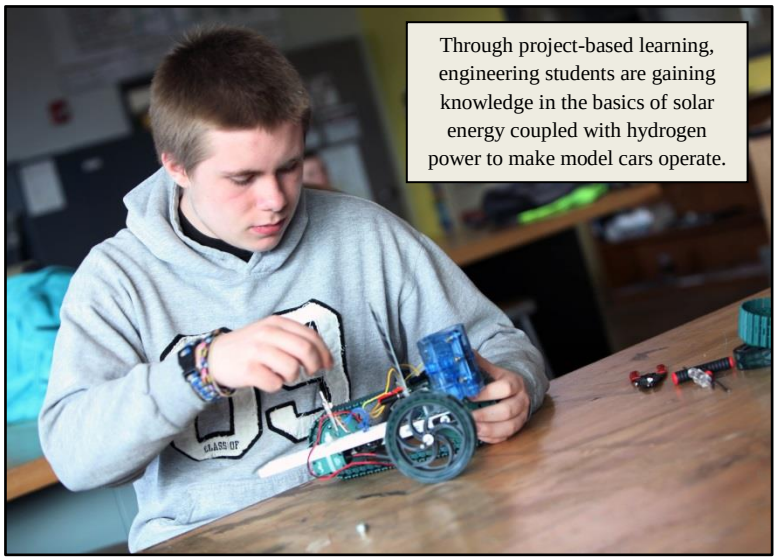
Terry Miller, former OCTE manufacturing technology consultant said a solid foundation in one or all of the skills areas that make up the manufacturing programs gives students who want to enter into the engineering field a big advantage not only from an educational standpoint but from a future employee perspective, as well.

Construction technology students actually create projects that are first designed in a computer program and transferred over to a machine known as a CNC wood router.

"Having been involved in the manufacturing industry for nearly 25 years years, I have seen, on many occasions, how beneficial it is to engineers to have an extensive background in programs such as welding, machine tool technology and industrial maintenance," he said. "They have a better understanding of what it takes to get a job finished in a timely and correct manner."

Todd Nickens, the OCTE automotive technology consultant said there are benefits to the program for both the students in auto-tech and engineering.

"For students who may be interested in Automotive Engineering, completing the Hybrid Pathway will expose them to how automotive systems actually react in the real world," he said. "For Automotive Technology students, it will expose them to the reasons that automotive systems react the way they do, such as engine operation, brakes, suspension, electrical, etc., and how one system on a vehicle affects the other systems it comes in contact with."



Through project-based learning, engineering students are gaining knowledge in the basics of solar energy coupled with hydrogen power to make model cars operate.

Educating engineers in general is a project-based type of learning that fits well with the CTE model, said PLTW's Mark Harrell, Director of School Engagement, Midwest Region.

"By creating hybrid pathways between PLTW and CTE, career pathways students will be exposed to Science, Technology, Engineering and Math (STEM) while seeing the relevance in their CTE courses," he said. "Students who enroll in one of the 11 OCTE approved hybrid pathways will have the opportunity to gain multiple, stackable credentials and have the skills needed to become both college and career ready."

Harrell added that the hybrid pathways are all about creating students who are not only college and career ready, but will have the skills to create a future high-skilled, high-wage workforce for Kentucky.

"We are very excited about deepening our partnership with OCTE in the Commonwealth. We have already been brainstorming other potential hybrid pathways to offer students with the rigor and relevance we both have to offer," he said. "With both organizations working together we can create a world-class workforce for Kentucky!"

Harrell explained how the program works by using the Electrical Engineering hybrid pathway under the Manufacturing Career Cluster as an example.

"A student entering this pathway would learn how to use a design process and computer aided design software to solve problems. They would also understand how to apply mathematical principals in the Introduction to Engineering Design PLTW course in his or her ninth grade year then apply those principles in their Electrical Principles CTE course their tenth grade year," he said. "As this student progresses through the pathway they will deepen their knowledge of both Engineering and Electrical Applications."

Harrell added that as that student nears the end of the pathway they will have an opportunity to gain their National Center for Construction Education and Research (NCCER) certification and possibly enroll in the (Tech Ready Apprentices for Careers in Kentucky (TRACK) pre-apprentice program.

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Taylor said these engineering pathways and TRACK are a good match because apprenticeship programs are growing in popularity and give students a chance to begin their workforce careers before graduation from high school.

“As we expand the TRACK program, the engineering pathways have come along at a very opportune time, especially in the construction technology area,” she said. “Skilled jobs in the construction sector are becoming more demanding due to the need to understand more of the engineering aspect of the business. It’s not just hammering nails anymore; it’s incorporating design techniques and energy essentials into the construction of facilities, for example, while learning operational necessities of a whole range of advance equipment.”

The engineering pathways are set to begin in the next school year but preparations are taking place now to get information out to administrators and counselors to enable interested students to make informed decisions about enrolling in these programs.

A list of these pathways can be found at http://kytech.ky.gov/PLTW_CTE_HYBRIDS.pdf.